

PCT

INTERNATIONAL SEARCH REPORT

(PCT Article 18 and Rules 43 and 44)

Applicant's or agent's file reference GIT-001WQ999	FOR FURTHER ACTION	see Notification of Transmittal of International Search Report (Form PCT/ISA/220) as well as, where applicable, item 5 below.
International application No. PCT/US03/35395	International filing date (day/month/year) 06 November 2003 (06.11.2003)	(Earliest) Priority Date (day/month/year) 06 November 2002 (06.11.2002)
Applicant GEOMETRIC INFORMATICS, INC.		

This international search report has been prepared by this International Searching Authority and is transmitted to the applicant according to Article 18. A copy is being transmitted to the International Bureau.

This international search report consists of a total of 2 sheets.



It is also accompanied by a copy of each prior art document cited in this report.

1. Basis of the Report

- a. With regard to the language, the international search was carried out on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.



the international search was carried out on the basis of a translation of the international application furnished to this Authority (Rule 23.1(b)).

- b. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international search was carried out on the basis of the sequence listing:



contained in the international application in written form.



filed together with the international application in computer readable form.



furnished subsequently to this Authority in written form.



furnished subsequently to this Authority in computer readable form.



the statement that the subsequently furnished written sequence listing does not go beyond the disclosure in the international application as filed has been furnished.



the statement that the information recorded in computer readable form is identical to the written sequence listing has been furnished.

2. ☐ Certain claims were found unsearchable (See Box I).

3. ☐ Unity of invention is lacking (See Box II).

4. With regard to the title,



the text is approved as submitted by the applicant.



the text has been established by this Authority to read as follows:

5. With regard to the abstract,



the text is approved as submitted by the applicant.



the text has been established, according to Rule 38.2(b), by this Authority as it appears in Box III. The applicant may, within one month from the date of mailing of this international search report, submit comments to this Authority.

6. The figure of the drawings to be published with the abstract is Figure No. _____



as suggested by the applicant.



because the applicant failed to suggest a figure.



because this figure better characterizes the invention.



None of the figures.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US03/35395

A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : G06K 9/00, 9/46, 9/62; G06T 15/10; G09G 5/00

US CL : 382/154, 203, 209; 345/427, 581

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 382/154, 203, 204, 209; 345/427, 581

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 6,424,745 (HANSEN et al) 23 July 2002 (23.07.2002), columns 1-7.	1
Y	"Interactive Geometry Remeshing" by Alliez et al. ACM International Conference on Computer Graphics and Interactive Techniques archive Proceedings of the 29th annual conference on Computer graphics and interactive techniques. July 2002, pages 347-354.	1
A	"Discrete Differential-Geometry Operators for Triangulated 2-Manifolds" by Meyer et al., 2002.	1

☐ Further documents are listed in the continuation of Box C.

☐ See patent family annex.

* Special categories of cited documents:	
"A" document defining the general state of the art which is not considered to be of particular relevance	"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"E" earlier application or patent published on or after the international filing date	"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
"O" document referring to an oral disclosure, use, exhibition or other means	"&" document member of the same patent family
"P" document published prior to the international filing date but later than the priority date claimed	

Date of the actual completion of the international search

19 May 2004 (19.05.2004)

Date of mailing of the international search report

14 JUN 2004

Name and mailing address of the ISA/US

Mail Stop PCT, Attn: ISA/US
Commissioner for Patents
P.O. Box 1450
Alexandria, Virginia 22313-1450

Facsimile No. (703)305-3230

Authorized officer

Amelia Au

Telephone No. 703-306-0377

NOTES TO FORM PCT/ISA/220 (continued)

The letter must indicate the differences between the claims as filed and the claims as amended. It must, in particular, indicate, in connection with each claim appearing in the international application (it being understood that identical indications concerning several claims may be grouped), whether

- (i) the claim is unchanged;
- (ii) the claim is cancelled;
- (iii) the claim is new;
- (iv) the claim replaces one or more claims as filed;
- (v) the claim is the result of the division of a claim as filed.

The following examples illustrate the manner in which amendments must be explained in the accompanying letter:

1. [Where originally there were 48 claims and after amendment of some claims there are 51]:
"Claims 1 to 29, 31, 32, 34, 35, 37 to 48 replaced by amended claims bearing the same numbers; claims 30, 33 and 36 unchanged; new claims 49 to 51 added."
2. [Where originally there were 15 claims and after amendment of all claims there are 11]:
"Claims 1 to 15 replaced by amended claims 1 to 11."
3. [Where originally there were 14 claims and the amendments consist in cancelling some claims and in adding new claims]:
"Claims 1 to 6 and 14 unchanged; claims 7 to 13 cancelled; new claims 15, 16 and 17 added." or
"Claims 7 to 13 cancelled; new claims 15, 16 and 17 added; all other claims unchanged."
4. [Where various kinds of amendments are made]:
"Claims 1-10 unchanged; claims 11 to 13, 18 and 19 cancelled; claims 14, 15 and 16 replaced by amended claim 14; claim 17 subdivided into amended claims 15, 16 and 17; new claims 20 and 21 added."

"Statement under Article 19(1)" (Rule 46.4)

The amendments may be accompanied by a statement explaining the amendments and indicating any impact that such amendments might have on the description and the drawings (which cannot be amended under Article 19(1)).

The statement will be published with the international application and the amended claims.

It must be in the language in which the international application is to be published.

It must be brief, not exceeding 500 words if in English or if translated into English.

It should not be confused with and does not replace the letter indicating the differences between the claims as filed and as amended. It must be filed on a separate sheet and must be identified as such by a heading, preferably by using the words "Statement under Article 19(1)."

It may not contain any disparaging comments on the international search report or the relevance of citations contained in that report. Reference to citations, relevant to a given claim, contained in the international search report may be made only in connection with an amendment of that claim.

Consequence if a demand for international preliminary examination has already been filed

If, at the time of filing any amendments and any accompanying statement, under Article 19, a demand for international preliminary examination has already been submitted, the applicant must preferably, at the time of filing the amendments (and any statement) with the International Bureau, also file with the International Preliminary Examining Authority a copy of such amendments (and of any statement) and, where required, a translation of such amendments for the procedure before that Authority (see Rules 55.3(a) and 62.2, first sentence). For further information, see the Notes to the demand form (PCT/IPEA/401).

Consequence with regard to translation of the international application for entry into the national phase

The applicant's attention is drawn to the fact that, upon entry into the national phase, a translation of the claims as amended under Article 19 may have to be furnished to the designated/elected Offices, instead of, or in addition to, the translation of the claims as filed.

For further details on the requirements of each designated/elected Office, see the *PCT Applicant's Guide*, Volume II.

NOTES TO FORM PCT/ISA/220

These Notes are intended to give the basic instructions concerning the filing of amendments under Article 19. The Notes are based on the requirements of the Patent Cooperation Treaty, the Regulations and the Administrative Instructions under that Treaty. In case of discrepancy between these Notes and those requirements, the latter are applicable. For more detailed information, see also the *PCT Applicant's Guide*, a publication of WIPO.

In these Notes, "Article," "Rule" and "Section" refer to the provisions of the PCT, the PCT Regulations and the PCT Administrative Instructions, respectively.

INSTRUCTIONS CONCERNING AMENDMENTS UNDER ARTICLE 19

The applicant has, after having received the international search report, one opportunity to amend the claims of the international application. It should however be emphasized that, since all parts of the international application (claims, description and drawings) may be amended during the international preliminary examination procedure, there is usually no need to file amendments of the claims under Article 19 except where, e.g. the applicant wants the latter to be published for the purposes of provisional protection or has another reason for amending the claims before international publication. Furthermore, it should be emphasized that provisional protection is available in some States only.

What parts of the international application may be amended ?

Under Article 19, only the claims may be amended.

During the international phase, the claims may also be amended (or further amended) under Article 34 before the International Preliminary Examining Authority. The description and drawings may only be amended under Article 34 before the International Preliminary Examining Authority.

Upon entry into the national phase, all parts of the international application may be amended under Article 28 or, where applicable, Article 41.

When ? Within 2 months from the date of transmittal of the international search report or 16 months from the priority date, whichever time limit expires later. It should be noted, however, that the amendments will be considered as having been received on time if they are received by the International Bureau after the expiration of the applicable time limit but before the completion of the technical preparations for international publication (Rule 46.1).

Where not to file the amendments ?

The amendments may only be filed with the International Bureau and not with the receiving Office or the International Searching Authority (Rule 46.2).

Where a demand for international preliminary examination has been/is filed, see below.

How ? Either by cancelling one or more entire claims, by adding one or more new claims or by amending the text of one or more of the claims as filed.

A replacement sheet must be submitted for each sheet of the claims which, on account of an amendment or amendments, differs from the sheet originally filed.

All the claims appearing on a replacement sheet must be numbered in Arabic numerals. Where a claim is cancelled, no renumbering of the other claims is required. In all cases where claims are renumbered, they must be renumbered consecutively (Administrative Instructions, Section 205(b)).

The amendments must be made in the language in which the international application is to be published.

What documents must/may accompany the amendments ?

Letter (Section 205(b)):

The amendments must be submitted with a letter.

The letter will not be published with the international application and the amended claims. It should not be confused with the "Statement under Article 19(1)" (see below, under "Statement under Article 19(1)").

The letter must be in English or French, at the choice of the applicant. However, if the language of the international application is English, the letter must be in English; if the language of the international application is French, the letter must be in French.

10/534035

WEINGARTEN, SCHURGIN, GAGNEBIN & LEBOVICI LLP
TEN POST OFFICE SQUARE
BOSTON, MASSACHUSETTS 02108

INTELLECTUAL PROPERTY LAW
PATENTS, TRADEMARKS AND COPYRIGHTS

STANLEY M. SCHURGIN
CHARLES L. GAGNEBIN III
VICTOR B. LEBOVICI
BEVERLY E. HJORTH
HOLLIDAY C. HEINE, Ph.D.
GORDON R. MORIARTY
JAMES F. THOMPSON
DAVID A. DAGG

TELEPHONE
617.542.2290
FACSIMILE
617.451.0313

THOMAS P. GRODT
RICHARD E. GAMACHE
CHI SUK KIM
OF COUNSEL
ARTHUR S. MORGENSTERN
JOSEPH WEINGARTEN
(1919-1984)

April 30, 2004

Mail Stop PCT
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

ATTN: International Searching Authority

Re: PCT International Application No. PCT/US2003/035395
International Filing Date: 06 November 2003
Entitled : ANALYSIS OF GEOMETRIC SURFACES BY CONFORMAL
STRUCTURE
Applicant : Geometric Informatics Inc.
Our File : GIT-001Xq999

Dear Sir:

Pursuant to PCT Rule 91.1(e), Applicant requests rectification of the following obvious error in the above-captioned PCT application as filed:

Page 5, line 11, replace [Figs. 1a and 1b depict] with --Fig. 1a depicts--; and

Page 5, line 13, replace [Figs. 1c and 1d depict] with --Fig. 1b depicts--.

The replacement consists of substitute page 5 (together with a copy showing the additions/deletions to the specification for the Examiner's convenience).

Applicant hereby requests the U.S. PCT Office to substitute page 5 for page 5 as filed on 6 November 2003 so that the Search Report can be based on the amended specification.

Any inquiry with respect to this Request should be directed to Applicant's below-signing representative.


01534035

JC20 Rec'd PCT/PTO 06 MAY 2005

Mail Stop PCT
Commissioner for Patents
April 30, 2004
Page 2

If an additional fee is required, the Commissioner is hereby authorized to charge the payment of such fee to Deposit Account No. 23-0804.

Respectfully submitted,


Gordon R. Moriarty
Registration No. 38,973

GRM/jow
305562-1

Enclosures

Other forms, features, and aspects of the above-described
5 methods and system are described in the detailed description
that follows.

The invention will be more fully understood from the
10 following detailed description taken in conjunction with the
accompanying drawings in which:

Fig. 1b depicts a checker board texture mapped from the
15 human face of Fig. 1a to the plane of Fig. 1b;

Fig. 3 is a spherical conformal embedding of a gargoyle model in a sphere;

20 Fig. 4 depicts a human brain model conformally mapped to a
sphere;

Figs. 6a-b depict zero points of parameterization;

Figs. 7a-d depict a global conformal atlas for genus two
25 and three tori;

Figs. 8a-d depict the topological equivalence but not conformal equivalence of two genus-one tori;

Figs.9a-d depict genus-one surfaces with different conformal structures;

30 Figs. 10 a-d depict the improvement in uniformity of the
global conformal parameterization;

Figs. 11a-d depict various genus-two surfaces with different conformal structures;

texture patches. In this way, the texture patches are "grown" and "stitched" together and then mapped to the parameter surface.

Other forms, features, and aspects of the above-described methods and system are described in the detailed description that follows.

BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWINGS

The invention will be more fully understood from the following detailed description taken in conjunction with the accompanying drawings in which:

[Figs. 1a and 1b depict] Fig. 1a depicts a conformal mapping between a human face and a square;

[Figs. 1c and 1d depict] Fig. 1b depicts a checker board texture mapped from the human face of Fig. 1a to the plane of Fig. 1b;

Figs. 2a-d depict various components of a holomorphic 1-form of a two hole torus;

Fig. 3 is a spherical conformal embedding of a gargoyle model in a sphere;

Fig. 4 depicts a human brain model conformally mapped to a sphere;

Fig. 5 depicts a bunny model mapped to the unit sphere;

Figs. 6a-b depict zero points of parameterization;

Figs. 7a-d depict a global conformal atlas for genus two and three tori;

Figs. 8a-d depict the topological equivalence but not conformal equivalence of two genus-one tori;

Figs. 9a-d depict genus-one surfaces with different conformal structures;

Figs. 10 a-d depict the improvement in uniformity of the global conformal parameterization;

Figs. 11a-d depict various genus-two surfaces with different conformal structures;